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# CURRENT LITERATURE IN AGRICULTURAL ENGINEERING

UNITED STATES DEPARTMENT OF AGRICULTURE  
BUREAU OF AGRICULTURAL ENGINEERING

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WASHINGTON, D. C.

April, 1935

## Agricultural Engineering.

Wanted: Agricultural engineers. By Raymond Olney. Georgia Ag. Engineer. 1935. p.11-14. Comparatively new branch of engineering; opportunities for development in this field are unlimited, and profession is not overcrowded as are some of older branches of engineering.

## Agriculture.

Agricultural investigations on the Newlands (Nev.) reclamation project. By E. W. Knight. 1935. 36p. U.S. Department of Agriculture. Technical bulletin no.464.

Agricultural revolution in the prairies and Great Plains of the United States. By Louis Bernard Schmidt. Agricultural History. v.8, no.4. October, 1934. p.169-195. Purpose of this paper is: first, to review factors that transformed Prairies and Great Plains of United States into agricultural empire supplying surplus products that made possible industrial revolution; and second, to survey present status and probable future of agriculture in these provinces.

Back to the land by infiltration. O.B. Martin. Farm and Ranch. v.54, no.1. January 1, 1935. p.14, 24.

Forty-fourth annual report for the fiscal year ended June 30, 1934. 1934. 78p. Washington. Agricultural Experiment Station. Bulletin no.305. Agricultural engineering, p.12-13.

Forty-sixth annual report, fiscal year ending June 30, 1934. 1934. 63p. Arkansas. Agricultural experiment station bulletin no.312. Agricultural engineering, p.9-10.

Retreat from the city. By Daniel C. Roper. Country Home. v.59, no.4. April, 1935. p.9-10, 28. Farmers are carrying their full share of nation's burden. It is unfair and unwise to push upon them as further competitors those who for time being cannot be employed in other callings. I see no permanent soundness in using soil merely as dump for urban unemployed; no real "security" in wide separation of highly specialized industrial worker and his job; and no assurance that if tide for the moment runs or is forced that way, people thus misplaced will stick. Relief costs in remote rural communities are only about a third as much as they are in metropolitan areas. That does not alter my conviction, however, that if we push decentralization unnaturally; if we get millions of people away out there ahead of factories and offices and factory and office jobs; if we go off half-cocked on "three acres and liberty basis" under social and emotional pressure - than a great deal of effort and money will be wasted, and our planned migrations are likely very shortly to be in large part reversed.

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Agriculture. (Cont'd)

There are not enough farms! Tractor is displacing tenants. By C.W. Mullen. Oklahoma Farmer-Stockman. v.48, no.2. January 15, 1935. p.5, 22. It is easy to see that tendency toward tractor-farming and larger farms restricts number of farms. There has never before been time in this country when shortage of farms was more serious import. There is no outlet to cities and industry, and probably won't be again soon. There are millions of people in cities among 10,000,000 unemployed who have agricultural background and who want to return to farm. There is plenty of land, but not enough farm units.

30-hour week and agriculture. By F. H. Clausen. Farm Machinery and Equipment. No. 1815. March 15, 1935. p. 7, 26. Proposed legislation would increase prices of farm equipment 20 per cent above present levels.

What has extension to contribute to an agricultural policy? By C. W. Warburton. Extension Service Review. v.6, no. 1 and 2. January-February, 1935. p.1-2.

Air Conditioning.

Air conditioning: its highlights and newer aspects. By Philip L. Davidson. Refrigerating Engineering. v.29, no.3. March, 1935. p. 119-124. General review touching upon several phases of subject such as distribution, amount of velocity of air, relations to lighting and noise, and nature of heat load.

Air conditioning for California homes. By Baldwin M. Woods and Benedict F. Raber. 1935. 45p. California. Agricultural Experiment Station Bulletin no.589.

Air washers provide moisture to order. By R. B. Purdy. Power. v.79, no. 3. March, 1935. p.140-141. Discusses air washer performance, types, and applications.

Diffusion of conditioned air. By Samuel R. Lewis. Heating, Piping and Air Conditioning. v.7, no.3. March, 1935. p. 138-139, 146. Drafts and other results of faulty air distribution are probable most common causes of complaints about both winter and summer comfort air conditioning. Avoiding such objections is subject.

Humidity regulator fits any heating plant. Popular Mechanics. v.63, no.1. January, 1935. p.13. Humidistat, set on wall of hall or any room desired, has indicating adjustment at its base and pilot lamp that lights when more moisture is required. Invar metal, which does not expand with heat, makes humidistat more accurate. When humidity becomes lower than that set on humidistat, it automatically opens a valve which feeds proper amount of water from water-supply system to steam generator in heating plant, resulting in vaporization of water. This vapor passes through a separator which permits only pure vapor to pass into house with hot-air stream of radiator.



Air Conditioning. (Cont'd.)

Research gives practical data on room cooling: Part 2. By A.P. Kratz, M. K. Fahnestock and S. Konzo. Domestic Engineering. v.145, no.3. March, 1935. p. 85-86, 115-117. Conclusions: 1. Unit room coolers should be operated and controlled to maintain constant dry bulb temperature in room, rather than to maintain complex schedule of indoor temperatures varying with outdoor temperature. 2. Unit room coolers, can be successfully adapted to cool from one to three medium sized rooms on same floor of residence. 3. Unit cooler of 300 lb. ice capacity and having melting rate of approximately 20 lb. of ice per hour would be adequate to handle normal cooling requirements of medium sized first story room of residence for most summer days, if no outdoor air other than that which comes by natural infiltration is introduced for ventilation. 4. Initial ice melting rate, or melting rate during first hour after unit was started, was nearly twice value of normal melting rate. 5. Of the total amount of heat absorbed by unit coolers, approximately from 16 to 38 per cent was absorbed in dehumidification process. 6. In addition to lowering of dry bulb temperature the relative humidity of air in rooms was, in most cases reduced about 15 points after three or more hours of continuous operation of units. 7. Although not centrally located on first story of residence, cooling units operated in living room effectively cooled and dehumidified air in adjoining rooms and there was some indication that reduction in relative humidity extended to second story. 8. With unit cooler located in living room and all interconnecting doors on first story open, maximum deviation of breathing level temperatures in any room on first story from mean temperature of entire first story was 2.1 degrees Fahr.

Alcohol.

Alcohol and alcohol-petrol mixtures as motor fuels. By R. Avice. International Sugar Journal. v.36, no.429. September, 1934. p.347-349.

Bill to compel use of alcohol-gas introduced by Illinois congressman. Wisconsin Agriculturist and Farmer. v.62, no.4. February 16, 1935. p.14. Would compel motorists to use blend of alcohol and gasoline or pay prohibitive tax of ten cents a gallon in addition to present state and federal gasoline taxes. Opponents of measure point out that: 1. Motoring costs already high through state and federal taxes, will be increased another \$30. per vehicle. 2. Financial benefit of experiment to farmers is questionable, while it is certain to increase cost of operating their trucks, tractors and automobiles. 3. Farm prices, including A.A.A. benefit payments, are higher than normal, price of petroleum products is 50 per cent below normal, so that it is unfair to handicap petroleum industry to aid more prosperous industry. 4. Penalizing of one domestic industry to subsidize another is unfair, unjust and dangerous as precedent. 5. Impartial tests have revealed that gasoline consumption of blended fuel is greater, engine starting more difficult in cold weather, and difficulties arise from separation of alcohol and gasoline in damp weather.

Study of alcohol manufacture from cane juice, A-molasses and final molasses. By Jose P. Sto. Domingo. Sugar News. v. 15, no.12. December, 1934.p.711-714.



Associations.

Proceedings of 41st annual meeting, American society of heating and ventilating engineers. Heating, Piping and Air Conditioning. v.7, no.3. March, 1935. p.160-169.

Building Construction.

Bond between reinforcing steel and brick masonry. By E. F. Gallagher. Brick and Clay Record. v.86, no.3. March, 1935. p.92-93. Results of study made of special shapes used in reinforced brick masonry. Shapes permit greater areas of mortar around steel.

Grooved brick with tie rod makes buildings stronger. Popular Mechanics. v.63, no.1. January, 1935. p.65. Increased safety may be built into home, factory or office building by using new grooved brick into which is imbedded a steel tie rod. Layer of horizontal rods at every fourth course of height is tied together with steel clamps connected to vertical rods, thus tying entire wall into solid mass. Vertical tie rods can be made in any length desired, so that brick mason is unhampered in laying brick. Special attention is given construction at corners of wall to give even greater safety. Buildings with walls of this type are said to be practically storm and earthquake proof. Walls can be of any thickness desired.

Oval nail with chisel point is easier to drive. Popular Mechanics. v.63, no.1. January, 1935. p.80. Sharp chisel point cuts cleanly across wood grain, allowing oval shank to enter wood with grain, free from fiber distortion.

Corrosion.

Protection of steel against corrosion. By Francis M. Hartley. Paint, Oil and Chemical Review. v.97, no.2. January 24, 1935. p.11-12.

Underground corrosion. By K. H. Logan. Proceedings of American Society of Civil Engineers. v.61, no.3. March, 1935. p.317-331. Underground pipes in United States have been estimated to have length of 450,000 miles and a value of nearly \$6,000,000,000. Annual loss due to underground corrosion of pipe lines in oil industry alone has been estimated at \$25,000,000. Soil corrosion is characterized by uneven distribution of corrosion and fact that most ferrous pipe materials corrode at nearly same rates. Major cause of corrosion seems to be non-uniformity in distribution of oxygen and moisture along surface of pipe line. Among methods suggested for reducing corrosion losses are use of copper and copper alloy pipe which corrode less rapidly than ferrous materials; increasing thickness of pipe walls; and use of protective coatings. Soil corrosivity surveys are suggested as means for determining need for protective coatings.

Cotton and Cotton Ginning.

Mechanical progress in cotton ginning to 1884. By Charles A. Bennett. Cotton and Cotton Oil News. v.36, no.12. March 23, 1935. p.12-14.



Cotton and Cotton Ginning. (Con'td)

Samuel Slater and the oldest cotton machinery in America. By Frederick L. Lewton. U.S. Government Printing Office, Washington, D. C. 1927. 505-511p. From the Smithsonian report for 1926.

Variable depth cotton planter. By B. M. Joyce. Southern Agriculturist. v.65, no.2. February, 1935. p.16. Attachment is operated by cam and suitable linkage and moves smoothly up and down in soil as planter travels along the row. Seeds are dropped upon gently undulating surfaces of furrow bottom where they are subject to somewhat different combinations of soil conditions which influence differently germination of seed and growth of plant. Seeds are planted at increased depths from shallow to deep and back to shallow. No two successive seeds are planted at same depth. Attachment plants seeds from surface of ground to as much as 2 inches deep. Fertilizer placements can be made simultaneously with planting of seed.

Culverts.

Durability of culvert types under service conditions. By W. S. Downs. Engineering News-Record. v.114, no.11. March 14, 1935. p.384-385. Rating survey of culverts on West Virginia highways brings our important conclusions on preferable design and construction practices. Object of survey was to secure information on: (1) durability of culvert types under actual service conditions; (2) adequacy of design; (3) character of workmanship and general methods of installation; and (4) other data which might lead to better practices in culvert economy.

Dairy Equipment.

Arranging the dairy stable. Hoard's Dairyman. v.80, no.1. Jan. 10, 1935. p.11. Illustrations show certain standard dimensions for dairy stable 34 feet wide in the clear. To accommodate two rows of cows in narrower stable would mean reducing widths of feed or litter alleys, or both.

Dams.

Additional data on model tests for Boulder Dam spillways. By D. C. McConaughy. Engineering News-Record. v. 114, no.14. April 4, 1935. p. 480-482. Discussion of tests made on models by Swiss laboratory defends design used for project. Full discharge will not place tunnel under pressure.

Grand Coulee is key dam. Washington Farmer. v.70, no.6. March 21, 1935. p.6. Seven outstanding advantages of the high dam over low are: 1. Construction of high dam would create very large water-storage capacity essential for stream-flow regulation. 2. High dam would increase commercially valuable, firm power at Grand Coulee about 580 per cent, and greatly reduce cost per kilowatt-hour, of electric power generated. 3. High dam would increase commercially valuable firm power at five dams below Grand Coulee and above Snake, on average of approximately 185 per cent, and reduce cost per kilowatt-hour output. 4. High dam would increase valuable firm power at four dams below Snake on



Dams. (Cont'd.)

average of approximately 185 per cent, and reduce cost per kilowatt-hour production. 5. High dam would increase commercially valuable firm power at Bonneville by approximately 90 per cent, and reduce cost of kilowatt-hour production. 6. High dam would make pumping of water economically feasible for rehabilitation and reclamation of 1,400,000 acres of fertile land in Columbia basin. 7. Placing of large areas of land under cultivation predicates even larger increases in population of state.

Protection against scour below overfall dams. By E. W. Lane and W. F. Bingham. Engineering News-Record. v.114, no.11. March 14, 1935. p.375-378. Four general conditions determine form of spillway and type of apron required to protect river bottom against scour. Need for model study emphasized and possibilities for savings therefrom indicated.

Security from under-seepage masonry dams on earth foundations: Discussion. By Donald J. Herbert, Arthur Casagrande and Calvin V. Davis. Proceedings of American Society of Civil Engineers. v.61, no.3. March, 1935. p.361-374.

Shrinkage of hydraulic fill in Miami Conservancy dams. By C. H. Eiffert. Engineering News-Record. v.114, no.14. April 4, 1935. p.482-483. Recapitulation of shrinkage records obtained since 1921 on Huffman and Germantown flood-protection dams of Miami Conservancy district.

Uplift and seepage under dams on sand: Discussion. By Harry H. Hatch, Donald J. Herbert and C. A. Mockmore and John W. Dougherty. Proceedings of American Society of Civil Engineers. v.61, no.3. March, 1935. p.375-381.

Diesel Engines.

Diesel power and field operating costs. 1934. 16p. Montana Agricultural Experiment Station. Bulletin no.289.

Electric Service, Rural.

Distribution service and costs. By M. M. Koch. Electrical World. v.105, no.6. March 16, 1935. p.21-24. Where opportunities lie for improving first and cutting last. Transformer ratings and loading. New developments. Bare wire and aerial code. Compromises with underground.

Electricity on the Farm.

Commercial uses of electricity in nurseries. By John Cooper. Rural Electrification and Electro-Farming. v.10, no.117. February, 1935. p. 295-298. Informative paper dealing with many uses of electricity in horticulture and nurseries generally.

Rural electrification as a field for agricultural engineers. By George W. Kable. Georgia Ag. Engineer. 1935. p. 31-32.



Electricity on the Farm. (Cont'd)

Seven years progress in rural electrification. By John M. McKee.  
Pennsylvania Farmer. v. 111, no. 9. October 27, 1934. p.34.

Erosion Control.

Agricultural engineer in soil erosion control. By O. E. Hughes.  
Georgia Ag. Engineer. 1935. p.27-29.

Control of wind erosion on Southern high plains. By H. H. Fennell.  
The Land, today and tomorrow. v. 2, no. 3. March, 1935. p.  
4-6. Several phases in wind erosion control, listed in order of  
their relative importance, are as follows: 1. Utilization of  
erosion resisting crop residues. 2. Moisture conservation for  
maintenance of vegetation. 3. Employment of emergency cover crops.  
4. Wind-break tree plantings. 5. Use of emergency tillage operations.

County goes to sea. By T. C. Richardson. Farm and Ranch. v.54, no.4.  
February 15, 1935. p. 2, 18. Legislation described represents new  
departure in conservation, and if enacted, Texas will again step to  
front of procession. It is time we ceased to think of conservation  
from different angles of flood control, crop production, water power  
and navigation, and think of all together as parts of complete program,  
no phase of which can be neglected without placing undue burden on  
other factors.

Fertilizer fights erosion. American Fertilizer. v.81, no. 11.  
December 1, 1934. p.13.

Forage crops hold soil. Washington Farmer. v.70, no.6. March 21,  
1935. p.11. Seed mixtures recommended for planting to halt erosion.

Holding on to the soil. By Ivy M. Howard. Southern Agriculturist.  
v.65, no. 2. February, 1935. p. 6, 30.

Kansas starts great battle to control wind erosion, Implement and  
Tractor. v.50, no.7. April 6, 1935. p. 12-13, 38. State project,  
with tractors and listers for western tablelands, is set in motion  
with Government aid. Designed to curb the elements, and to end dust  
blowing.

Let nature help heal the gullies. Oklahoma Farmer-Stockman. v.48,  
no.3. February 1, 1935. p.5, 21.

Returning protection to the land. By Albert H. Law. Farm and Ranch.  
v.54, no.2. January 15, 1935. p. 1, 4, 16.

Saving the soil as well as the water. By F. L. Dulcy. Agricultural  
Leaders' Digest. v.16, no.1. January, 1935. p.14.

Soil blowing and dust storms. By Charles E. Kellogg. 1935. 11p.  
U.S. Department of Agriculture. Miscellaneous Publication no.221.



Soil erosion and its prevention, a partial list of references, 1900-1934. Compiled by Dorothy Graf. Librarian. 1935. 9lp. Mimeographed. U.S. Department of Agriculture. Bureau of Agricultural Engineering.

Farm Buildings and Equipment.

Battle for adequate farm buildings. By R. C. Miller. Agricultural Engineering. v.16, no.3. March, 1935. p. 111-112.

Builds an arch type machine shed. Hoard's Dairyman. v.80, no.2. January 25, 1935. p.33. Built "igloo" shed in 1925 at cost of \$200 for materials. Rafters are set in concrete wall,  $3\frac{1}{2}$  feet high, which encloses building. There is concrete abutment in middle of each side to support snow load on roof and to prevent bulging. Rafters are spaced 2 feet apart and are built on 14-foot radius. It is 14 feet from floor to top of roof. Each rafter is constructed of four 1 x 4's bolted and nailed together. Arch effect was secured by staking one end in ground and bending rafter, then staking other end.

Engineering farm buildings. By R. H. Driftmier. Georgia Ag. Engineer. 1935. p.13-19.

Expert specifies hog house details. American Builder and Building Age. v.57, no. 4. April, 1935. p. 90, 92. Gives construction details.

Farm home improvement now possible under Federal Housing Administration. By James R. Branson. Hoosier Farmer. v.19, no.2. March, 1935. p.8, 29. Purpose is to stimulate better living conditions for people of America both in cities and on farms, to reduce unemployment, and to begin again creation of tangible useful wealth. Modernization and repair program of Housing Administration offers means by which farm owners can check this long-continued depreciation of farm property and improve value and efficiency, not only of their homes, but of all permanent improvements to farmstead,

To save on hog houses. Kansas Farmer. v.73, no.5. March 2, 1935. p.8. Colony hog houses may be simply constructed out of native lumber. Built A-shaped house, 7 feet and  $\frac{1}{2}$  inch wide, 5 feet high at peak, and 6 feet deep. These dimensions make angle at top almost right angle. Roof boards run up and down - six 12-inch boards for each side. To save sawing, nailing, and for strength, the back wall is laid in diagonally, boards running from one side to floor. Front can be equipped with diagonal board on each side, leaving V-shaped opening, instead of regular oblong door.

Farm Machinery and Equipment.

Agricultural engineering for farm power and machinery. By Leonard J. Fletcher. Georgia Ag. Engineer. 1935. p. 21-23.



Farm Machinery and Equipment. (Cont'd)

Chopping hay to increase storage. By A. J. Schwantes. Implement and Tractor. v.50, no. 7. April 6, 1935. p. 17, 38.

Cost of housing machinery. By I. W. Dickerson. Pennsylvania Farmer. v. 111, no. 12. December 8, 1934. p. 14. Results of two western surveys showed cost of repairs for housed binders to average 1.38 cents per acre, while for those not housed it was 2.63 per acre, or an average advantage of 1.25 cents per acre in favor of housing binders.

Gyrolette: A new rotary plow. Facts About Sugar. v. 30, no. 1. January, 1935. p. 9-10. Has successful field demonstration in Louisiana. "Gyrolette" is small gyrotiller attachment, designed to be mounted on 35 horsepower Caterpillar Diesel tractor. Revolving tilling implements on this attachment are driven directly from tractor engine through power take-off, and lifting of implements is accomplished by power drive hoist mounted on forward part of tractor and obtaining its power through connection to front of engine. Mounting of attachment requires no alteration of tractor. By pulling hinge pins by which tilling end is connected, "gyrolette" is immediately disconnected and tractor is released for other use. As with gyrotiller, tiller is effected by cutters rotating in approximately horizontal plane, whose action is to crumble soil rather than to wedge it apart in slices. There is thus a notable absence of compression of soil, and high degree of tilth is obtained. Total depth of tilling possible is 15 inches, width of cut 6 feet, and machine can till four acres in ten-hour day, depending on depth tilled and toughness of soil.

Joseph Smith, individualist. By Lewis Ely Thompson. Pennsylvania Farmer. v. 111, no. 12. December 8, 1934. p. 5, 20. Inventor of plow.

Mechanized cereal farming, Implement and Machinery Review. v. 60, no. 719. March 1, 1935. p. 962-964.

Next week's farm equipment show. By Roy R. Moore. Kansas Farmer. v. 73, no. 5. March 2, 1935. p. 3, 17.

1935 buyer's guide. Chicago, Ill., Farm Implement News, 1935. 384p.

Relation of digger operation to potato tuber injury. By E. V. Hardenberg. American Potato Journal. v. 11, no. 7. July, 1934. p. 171-176.

Trade protests against FERA plan. Farm Machinery and Equipment. no.1815. March 15, 1935. p. 5-6. Condemns Arkansas method of furnishing farm equipment to rehabilitants as calculated to demoralize price structure and to ruin established dealers.

Farm Mechanics.

Fitting the farm saws. By L. M. Roehl. 1935. 32-. Cornell University. Extension Circular no. 745.



Farm Mechanics. (Cont'd)

Home tanning of leather. By M. K. Thornton. 1935. 15p. Texas. Agricultural and Mechanical College. Extension Service. Bulletin no. 86.

Fences.

Profits will be made this spring in sale of fencing. American Lumberman. no. 3043. March 16, 1935. p. 22-23. Farmers can see benefits of relocating fences and gates to meet post-drought pasturage problems, and needs of New Deal agriculture: and will appreciate aids in planning farm layout for efficiency and economy.

Fertilizer Spreaders.

Handy fertilizer dropper. By Frank A. Campbell. Market Growers Journal. v.56, no. 5. March 1, 1935. p. 112-113. Diagram.

Fire Protection.

Fighting fires in your home. Popular Mechanics. v.62, no. 6. December, 1934. p. 882-884, 116A, 118A.

Flood Control.

Bibliography on flood control. Compiled by Dorothy Graf, Librarian. 1935. 9p. Mimeographed. U.S. Department of Agriculture. Bureau of Agricultural Engineering.

Flood protection data: Progress report of the committee. Proceedings of American Society of Civil Engineers. v.61, no. 3. March, 1935. p. 333-340.

Revised Mississippi flood plan subject to extended hearings. Engineering News-Record. v. 114, no. 15. April 11, 1935. p. 537. Both favored and attacked in hearings before the committee on flood control of the House of Representatives.

Revised plan of flood control for the Mississippi River. Engineering News-Record. v. 114, no. 14. April 4, 1935. p. 492-494. Includes payments for land rights for floodways, substitution for Boeuf floodway of a controlled floodway in the Tensas Valley, a new floodway in the Atchafalaya Basin and flood control of the St. Francis and Yazoo rivers.

Floors.

Pittsburgh home builder pioneers new type floor. American Builder and Building Age. v.57, no. 4. April, 1935. p. 88-89. Typical floor plan showing layout of Robertson "Keystone Beam" steel floor units is diagramed and detail sketches make clear how walls and floors are constructed.



### Flow of Water.

- Bentzel velocity tube. By Francis H. Falkner. Civil Engineering. v. 5, no. 4. April, 1935. p. 222-224.
- Bridge piers as channel obstructions. By David L. Yarnell. 1934. 52p. U.S. Department of Agriculture. Technical Bulletin no. 442.
- Flow of water around bends in pipes: Discussion. By David L. Yarnell. Proceedings of American Society of Civil Engineers. v. 61, no. 3. March, 1935. p. 356-357.
- Pitot tube in current practice. By Edward S. Cole. Civil Engineering. v. 5, no. 4. April, 1935. p. 220-222.
- Ten-foot weir and Venturi meter compared. By C. M. Allen and L.J. Hooper. Civil Engineering. v. 5, no. 4. April, 1935. p. 218-220. Present record of degree of accuracy that can be expected from weir and venturi meter when maintained in good condition. They have collated comparative measurements made by these devices over period of forty years at Worcester Polytechnic Institute.

### Forage Drying.

- Artificial drying of young grass. By H. L. Goodman. Journal of Ministry of Agriculture. v.41, no.11. February, 1935. p. 1049-1057.

### Hitches.

- Larger teams save time and energy. By I. W. Dickerson. Oklahoma Farmer-Stockman. v.48, no. 1. January 1, 1935. p. 17. Diagrams of hitches.

### Hotbeds.

- Building hotbeds. Farm and Ranch. v.54, no. 4. February 15, 1935. p.20.
- Electric hotbeds for propagating woody cuttings. By Donald Wyman and Maurice T. Nixon. 1934. 21p. Cornell University. Agricultural Experiment Station. Bulletin no. 618.

### Houses.

- Banks and housing. Printers' Ink. v. 163, no. 13. Sept. 27, 1934. p. 81-84.
- New and approved details for quality home construction. By John J. Falkenberg. American Builder and Building Age. v. 57, no. 4. April, 1935. p. 46-48. Drawings are actual working details. Four principles which when combined and strictly followed are bound to produce well built house: First - Material must be chosen to suit its use. Second - Mechanical process of assembly and

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Houses. (Cont'd)

fabrication must be performed logically, but not hurriedly. Third - Workmanship must be skilled and intelligent. Fourth - Structural plan and detail must be sound and based on characteristics of materials to be used and condition of occupancy of finished building.

Steel frame house has arc-welded wall panels. Construction Methods. v. 16, no. 12. December, 1934. p. 26-27.

Standardized-room-unit plan used in new experimental house. Engineering News-Record. v. 114, no. 12. March 21, 1935. p. 423-424. Built by General Electric Co., at Nela Park, Cleveland, Ohio. Purpose of experiment was to determine if such method of design would permit relatively low cost of construction and at same time make it possible to equip house with many new labor-saving and convenience devices; also to ascertain if such structures could perhaps be produced on mass production basis.

Uncle Sam backs home building. Popular Mechanics. v. 62, no. 6. December, 1934. p. 850-852, 124A.

Houses, Remodeling.

Remodeling the square house. By J. C. Wooley and Fra Clark. 1935. 4.p. Missouri. College of Agriculture. Agricultural Extension Service. Circular no. 320.

Hydraulics.

Current work at University of Wisconsin. Engineering News-Record. v. 114, no. 13. March 28, 1935. p. 455-457. Hydraulic engineering: air-lift pumping, triangular weir coefficients, filter sands, water hammer, venturi meter coefficients, house plumbing, erosion control structures, sewage sludge.

Hydraulic jump in terms of dynamic similarity: Discussion. By Hunter Rouse. Proceedings of American Society of Civil Engineers. v. 61, no. 3. March, 1935. p. 421-424.

Insulation.

Rice-hull ash insulation blown into building. Popular Mechanics. v. 63, no. 1. January, 1935. p. 60. Rice-hull ashes are blown into attics of homes and office buildings to serve as insulation by recent process which makes it possible to put four-inch layer of this fireproof material in place quickly. Thin layer of ash powder is laid first, then fluffy portion of ash, and over this another layer of powder is spread. This keeps ash from packing and enables it to retain its millions of air cells necessary for insulation purposes. Ash does not pass through blades of blower, but enters discharge pipe through a hopper. Flexible pipe in attic assures even distribution.



Irrigation.

Boron, in soils and irrigation waters and its effect on plants, with particular reference to the San Joaquin valley of California. By Frank M. Eaton. 1935. 132p. U.S. Department of Agriculture. Technical Bulletin no. 448.

Leaky hose irrigation. By John H. Harwood. Capper's Farmer. v. 46, no. 4. April, 1935. p. 24.

Orchard tillage under straight-furrow irrigation. By C. A. Taylor. Agricultural Engineering. v. 16, no. 3. March, 1935. p. 99-102. In summary, changed ideas concerning fundamental requirements of orchard cultivation have necessitated changes in implements used to perform orchard tillage operations. There are many orchard operations that conflict and careful planning is required to bring tillage into accord with all other phases of orchard program. Disks must be designed to give maximum cutting action on cover crops with uniform and shallow penetration. Under straight-furrow irrigation control of weeds and preparation of furrows for irrigation can be combined into one operation. Implements to combine these two operations are being developed. This makes use of permanent furrows feasible, and they can be made broad and shallow so that more of the fertile top soil is available to feeder roots. Water can be spread over land more uniformly and high degree of efficiency in irrigation can be obtained. When this is accomplished, problems due to overirrigation are automatically taken care of. Rainfall is conserved by diverting runoff from more compacted soil and spreading it onto more absorptive area along tree lines. This aids in control of erosion and leads to more permanent agriculture.

Land.

Guarding Montana's land resources. By Alfred Atkinson. Montana Farmer. v. 22, no. 13. March 1, 1935. p. 3.

Method of rural land classification. By Charles E. Kellogg and J. Kenneth Ableiter. 1935. 30p. U.S. Department of Agriculture. Technical Bulletin no. 469.

National planning. By Charles W. Eliot, 2nd. Landscape Architecture. v. 25, no. 1. October, 1934. p. 12-18.

Trends in present-day land and community planning in United States. By Harold S. Buttonheim. Planning and Civic Comment. v. 1, no. 1. January-March, 1935. p. 2-5.



## Land Clearing.

- 14 -

Stump burner uses forced draft. Popular Mechanics. v. 62, no. 6. December, 1934. p.847. Consists essentially of an electric motor or small gasoline engine driving a centrifugal fan in a housing. Through outer circumference of housing project twelve nozzles to which pieces of rubber hose are attached. To end of each piece of hose four-foot length of gas pipe is fastened. To start roaring fire in stump, auger holes are bored around base, all angling toward middle. Crankcase oil and gasoline are poured into each hole and this is ignited. Then end of gas pipe is inserted in hole and blast of air causes oil to burn rapidly. Soon oil in each hole is burned, but by that time each pipe is red hot and stump is afire and burning toward center. As fires from various angles unite, natural draft is provided and forced-draft equipment can be moved to next stump. Forced draft can also be applied to any large roots which remain after stump is burned to ground as burner will also destroy them.

## Miscellaneous.

Control of distribution. By Theodore H. Brown. Mechanical Engineering. v. 56, no. 12. December, 1934. p. 718-722, 764. Discussion of statistical methods, with illustrative examples.

Early U. S. steam tables. By Arthur M. Greene, Jr. Mechanical Engineering. v.56, no. 12. December, 1934. p. 715-717, 764. Historical summary of tabulations published in this country prior to 1921.

Open air skating rink. Refrigerating Engineering. v. 29, no. 1. January, 1935. p. 30.

## Motors.

Motor operated by sunlight produces electricity. Popular Mechanics. v. 63, no. 1. January, 1935. p. 23. Sunlight falling on metal plates coated with sensitive, photo-electric material is used as source of power for miniature motor to generate electricity. Output of four milliamperes is obtained, sufficient to spin rotating armature four inches in diameter and weighing three ounces. Only factor that prevents wider application of this means of transforming sunlight into electricity is expense of coating materials for the plates. Getting sufficient output is matter of increasing area of surface exposed to sunlight.

Power of gasoline motor increased by back pressure. Popular Mechanics. v. 62, no. 6. December, 1934. p. 854. It is claimed this type of engine will not only cut fuel consumption in half when used in automobiles, but is ideal motor for planes since weight per horsepower is halved and cruising radius of such motor is increased because of greater power derived from fuel carried.

## Paints and Painting.

Priming-coat reductions for painting new wood surfaces. By F. L. Browne. Paint, Oil and Chemical Review. v. 25, no. 96. December 13, 1934. p. 12, 14, 16, 18-19. Principal object of study is to discover



Paints and Painting. (Cont'd)

optimum priming-coat reduction in applying common house paints to softwoods and to determine whether priming coat should be reduced differently according to nature of softwood painted.

Routing darkness with paint. By Helen B. Ames. Successful Farming. v. 33, no. 4. April, 1935. p. 12, 32-33.

Special priming paints for wood. By F. L. Browne. Industrial and Engineering Chemistry. v. 27, no. 3. March, 1935. p. 292-298.

Poultry Houses and Equipment.

That new hen house. By Miller Purvis. Breeder's Gazette. v. 99, no. 9. September, 1934. p. 10.

Trapnest for turkey hens. By V. S. Asmundson and H. L. Bolton. Pacific Rural Press and California Farmer. v. 129, no. 5. February 2, 1935. p. 110. Diagram.

Power.

The horse. By Wayne Dinsmore. Country Home. v. 59, no. 4. April, 1935. p. 14, 36-39. One thing is certain, and that is that increased use and production of horses and mules will help mightily in bringing about better balance between supply of, and demand for, farm products. Farmer knows that ultimate cost of farm tractor and truck is found, in end, in decreased prices.

Methods in tractor power. By John E. Pickett. Pacific Rural Press. v. 129, no. 9. March 2, 1935. p. 223.

Power Projects.

Waste or progress? Popular Mechanics. v. 63, no. 1. January, 1935. p. 34-40. Approximately one billion dollars is being spent by the Federal Government to develop hydroelectric resources of nation. This vast sum is split among nine vast plants. Greatest is Muscle Shoals, or Tennessee-Valley development. Here the Government has projected an outlay of some \$300,000,000. Boulder dam, on California-Nevada border, draws \$165,000,000; Grand Coulee, in Washington state, calls for an expenditure of \$63,000,000; Bonneville, in Oregon, \$43,000,000; Fort Peck, in Montana, \$59,000,000; Verde, Caspar-Alcova and Owyhee, in Arizona, Wyoming and Idaho-Oregon respectively, \$49,600,000 and Loup river, Nebraska, \$7,300,000. Supplement foregoing figures with initial cost of Muscle Shoals - \$150,000,000 - and \$140,000,000 advanced to states and municipalities plus subsidiary program cost of TVA and total hovers around one billion dollars.

Public Works.

Great volume of concrete work in conservation program. By A. F. Unckrich. Concrete. v. 43, no. 2. February, 1935. p. 13-14. Involves construction of concrete and earth-fill dams, check dams, spillways,



Public Works. (Cont'd)

revetments; relocation of highways; bridges and buildings; water-works and sewage disposal plants.

Pumps and Pumping.

Water supply and pumps. Rural Electrification and Electro-Farming. v.10, no. 117. February, 1935. p. 302-305.

Rain and Rainfall.

Frequency, extent, and severity of droughts since 1881. By Lloyd L. Harrold. Engineering News-Record. v. 114, no. 14. April 4, 1935. p. 478-479. Table 1. Six years of lowest precipitation, 1881-1934.

Reclamation.

Columbia river planning to continue without establishment of authority. Engineering News-Record. v. 114, no. 13. March 28, 1935. p. 454. President Roosevelt does not favor creation of Columbia River Authority at present time, according to Marshall N. Dana, chairman, Pacific Northwest Regional Planning Commission, and district chairman of National Resources Board. President prefers continuance of fact-finding and plan-making such as that now in progress by regional planning commission. This commission has already undertaken the preparation of a ten-year plan for general development in Northwest states keyed to federal power projects at Bonneville and Grand Coulee. System of trunk inland waterways for Washington, Oregon and Idaho is assuming prominence in plan of Pacific Northwest development. This system involves use of Columbia River for an east-west artery from Pacific Ocean to Lewiston, Idaho, and joining of Puget Sound, Grays Harbor, Willapa Harbor and Columbia River in north and south artery through western Washington. Willamette River from its mouth to Eugene, Oregon, would also be part of system. Development on Willamette would, if undertaken, be in harmony with other plans for river systems to include flood control, drainage and supplemental irrigation, but probably without power development until full effect of Bonneville and Grand Coulee is known.

Reclamation as a national policy. By Marshall N. Dana. Reclamation Era. v. 25, no. 3. March, 1935. p. 45-46. Report presented at meeting in Salt Lake City of National Reclamation Association.

Refrigeration.

Air as a refrigerant. By R. U. Berry. Refrigerating Engineering. v. 29, no. 3. March, 1935. p. 135-136. Leblanc machine analyzed.

Farm cooling of eggs. By E. M. Funk. Ice and Refrigeration. v. 88, no. 4. April, 1935. p. 271-273. Illustrated description of tests made to determine temperature changes in eggs held in different containers at various temperatures. Effect of circulation of air.



Refrigeration. (Cont'd)

Heat transmission in cooling air with extended surfaces. By W. L. Knaus. Refrigerating Engineering. v. 29, no. 1. January, 1935. p. 23-26. Objectives: (1) to review studies which have been made to establish relation between sensible heat transmission and dehumidification; (2) to present methods that are simple, reasonably accurate, and convenient to use in allowing for moisture condensation; and (3) to illustrate use of these methods of applications.

Home-made meat cooling box. Pacific Rural Press. v. 129, no. 7. February 16, 1935. p. 169. Box consists of insulated outer shell, inside which is crate for holding meat. Removable metal cover fits over top of crate so that ice can be placed above meat as well as at both sides. With this arrangement temperatures below 40 degrees F. can be obtained with ice alone. Box consists of crib of 2 by 4's, with outer shell of tongue and groove flooring. Space between crib and sheathing is insulated with dry sawdust or shavings. Insulation must be dry. To give more efficient insulation the 2 by 4's should be painted as they are spiked together.

This painting with inner lining of galvanized iron, presents most effective barrier to moisture, the enemy of cold-storage insulation. Floor is insulated with 3 inches of corkboard, coated with tar and covered with concrete. Drain pipe and trap is installed to carry off water from melting ice. Materials and labor for construction will total about \$90.00.

Precooling fresh fruits in refrigerator cars. By F. C. Gaylord, K.I. Fawcett, and T. E. Hinton. Agricultural Engineering. v. 16, no. 3. March, 1935. p. 113-115.

Refrigerated van is cooled by fuel that runs motor. Popular Mechanics. v. 62, no. 6. December, 1934. p. 863. New fuel called Petrogas, which is carried as liquid at pressure of 135 pounds in two cylinders containing about 23 gallons each, is secret of fuel-cooling system. This fuel is converted from liquid under pressure to gas, resulting in heat absorption and refrigeration of truck body as it passes to motor. When it reaches mixing valve and goes in to intake manifold, fuel has become dry gas that runs motor at high efficiency. Elimination of crankcase lubricating oil dilution is claimed, resulting in large saving on oil. Fuel is marketed at approximately same price, on performance basis, as regular gasoline, but it has added advantage of serving both as fuel and refrigerant.

Refrigeration and readjustment in the Tennessee Valley. By W. R. Woolrich. Refrigerating Engineering. v. 29, no. 1. January, 1935. p. 13-15.

Standards and codes for small refrigerating machines. By W. M. Timmerman. Refrigerating Engineering. v. 29, no. 1. January, 1935. p. 20-22, 28, 52. Reviews progress which has been made on various refrigerator projects which have been under way for some time.



### Relief.

Rural families on relief. By Josephine C. Brown. Annals of The American Academy of Political and Social Science. v. 176. November, 1934. p. 90-94. There are under care of emergency relief organizations of several states approximately 1,700,000 rural families, comprising between 6,500,000 and 7,000,000 individuals. This total includes residents of small industrial communities. There are in addition an undetermined number of rural relief families and single persons in which there is some type of social maladjustment or long-time dependency, including families in which fathers are dead or incapacitated and assistance to mothers is being given under provisions of state law. Large percentage of rural population has lived for generations at minimum subsistence levels, and has been able to live at all only because agricultural workers are not, as in case of other classes of employees, completely dependent on money economy. Farm worker has been able to a great extent to effect direct conversion of labor into subsistence necessities. He has lived on primitive level, but he has lived.

### Repairs and Repairing.

Money for farm repair inside and out. By R.B. Lawrence. Kansas Farmer. v.73, no. 3. February 2, 1935. p. 6.

Now is the time to repair the house. By Mrs. Bernice Claytor. 1935. 8p. Texas. Agricultural and Mechanical College. Extension service. Circular no. 102.

### Research.

Report of Committee on research for 1934. By John Howatt and F. C. Houghton. Heating, Piping and Air Conditioning. v. 7, no. 3. March, 1935. p. 152-159.

Research at the 1934 convention of the Association of Land Grant colleges and universities. Experiment Station Record. v. 72, no.2. February, 1935. p. 145-149.

### Roofs.

Need not tear off old shingles. By J. B. Rodgers. Idaho Farmer. v. 53, no. 3. February 7, 1935. p. 4. Compares two methods.

### Run-off.

Permanent-furrow system for controlling run-off. California Cuvltivator. v. 82, no. 3. February 2, 1935. p. 64. Conserves both irrigation water and rainfall. This system of cultivation is adapted to citrus orchards where straight-furrow irrigation is used. Seven shallow furrows are generally used and they are laid out with side-slopes of three to one by new type of furrowing implement. These relatively flat-sided slopes in furrows are particularly advantageous in control of erosion.



Silt.

Silt problem: Discussion. By E. W. Lane and Frank E. Bonner.  
Proceedings of American Society of Civil Engineers. v. 61, no. 3.  
March, 1935. p. 404-411.

Soil Moisture.

Soil-water movement as affected by confined air. By W. L. Powers.  
Journal of Agricultural Research. v. 49, no. 12. December 15, 1934.  
p. 1125-1133. Air pressure definitely increased vertical movement  
of capillary soil moisture. Any value of suction in tile drains  
would seem to be limited to short intervals. Furrow irrigation would  
tend to confine soil air less than flooding and therefore may favor  
penetration of irrigation water. Dispersion at soil surface retards  
infiltration of water.

Soils.

47 kinds of soil. Pennsylvania Farmer. v. 111, no. 9. October 27,  
1934. p. 2, 32. Gives soil map of Pennsylvania.

Greenhouse soil treatments. By Walter S. Balch. Market Growers Journal.  
v. 56, no. 5. March 1, 1935. p. 118-119. Purpose of experiment  
was to compare steam with some chemicals as medium for sterilizing the  
soil. It was thought desirable also to determine length of time which  
these materials might affect soil in order to determine what time may  
intervene between treatments using these various materials.

Subsistence Homesteads.

Facts about subsistence homesteads program from bulletin 1 of Division  
of subsistence homesteads. Architectural Record. v. 77, no. 1.  
January, 1935. p. 10-13.

Housing standards for subsistence homesteads. By Bruce L. Melvin.  
Architectural Record. v. 77, no. 1. January, 1935. p. 9-10.  
Position taken in paper is personal; it is inconclusive, but predicated  
on belief that standards must constantly change and that accumulating  
information will correct errors in position taken.

Fenderlea homesteads. By Gordon VanSchaak. Landscape Architecture.  
v. 25, no. 2. January, 1935. p. 75-80. Development of a subsistence  
homesteads project.

Subsistence farm gardens. By V. R. Beattie and others. 1935. 54p.  
U. S. Department of Agriculture. Farmers' bulletin no. 1746.

Subsistence homesteads for industrial and rural workers at end of 1934.  
Monthly Labor Review. v. 40, no. 1. January, 1935. p. 19-37.

Unemployment and subsistence farming. By Henry A. Wallace. Architect-  
ural Record. v. 77, no. 1. January, 1935. p. 5-7.



### Surveying.

Future mapping of the United States. Letter from W. N. Brown. Engineering News-Record. v. 114, no. 11. March 14, 1935. p. 395.

State surveying and mapping bureaus. By John S. Dodds. Civil Engineering. v. 5, no. 4. April, 1935. p. 249-251. Proposes formation of central agency in each state for collecting and assembling all surveying and mapping data for area. This agency would collect and file information from both public and private sources and make it available to all engines, surveyors and map users.

### Terracing.

New power equipment for terracing. By M. L. Nichols and R. E. Yoder. Agricultural Engineering, v. 16, no. 3. March, 1935. p. 93-96, 102. Terracing itself is essentially sound and simple, and is based upon practical experience of several generations of farmers. It does not involve any violent reorganization of farm practice. Construction of terraces of proper type is first step in any successful soil erosion control program in states of the Southwest. Tractors for terracing. Terraces. Place of equipment in farm program. Equipment described in paper, does not depend for its profitable use on any reorganization of farm power program.

Flow up the terraces! Oklahoma Farmer-Stockman. v. 48, no. 2. January 15, 1935. p. 3, 19. Terracing by itself does not completely control soil losses. To that situation there is only one answer - contour farming. Rows that run with terrace lines are themselves miniature terraces. Large per cent of rainfall is held in these nearly level rows. Water in rows soaks into soil and helps make a crop. Most of water that gets as far as terrace causeway is water lost.

Requirements of farm machinery for terraced land. Ralph W. Baird. Agricultural Engineering. v. 16, no. 3. March, 1935. p. 97-98, 102. Requirements of farm machinery for terraced land: (1) Flexibility in vertical plane to allow for unevenness of ground surface; (2) compactness longitudinally, to follow crooked rows and reduce effect of uneven ground surface; (3) positive steering; (4) wheels and lugs designed to reduce creep as much as possible; (5) low center of gravity; and (6) selection of widths that will make operation of tractor on steepest part of ridge unnecessary.

### Tires.

Pneumatic tires for plantation vehicles. International Sugar Journal. v. 37, no. 434. February, 1935. p. 52-53. Consists of pneumatic tires on steel artillery wheels with roller bearings.

Rubber tires for tractors. By W. C. Lassetter. Progressive Farmer. v. 50, no. 3. March, 1935. p. 18.



### Tractors.

Inconsistencies in tractor rating. By B. D. Moses. Implement Record. v. 32, no. 4. April, 1935. p. 17.

Nebraska tractor tests, 1920-1934. 1935. 40p. Nebraska. Agricultural experiment station. Bulletin no. 292.

Sound basis for tractor trade. Implement and Tractor. v. 50, no. 7. April 6, 1935. p. 16. Lower relative cost of power, availability in smaller units, increased performance on rubber, with shortage of good work stock are hastening swing to mechanized farming. Graph shows decline in number of work animals during last quarter-century, which is least evident in mules.

The tractor. By Arnold P. Yerkes. Country Home. v. 59, no. 4. April, 1935. p. 15, 39, 48-49.

Tractor guide saves labor for the farmer. Popular Mechanics. v. 62, no. 6. December, 1934. p. 877. Rows and furrows are made of uniform width and straighter than is possible when tractor is steered manually. Operator is left free to watch and adjust his cultivator or other implement instead of giving his attention to steering when tractor is moving. Lever lift enables guide to be raised or lowered easily, rigid push member drives guide wheels from rear, thus eliminating side draft, and raising of guide wheels does not alter course of tractor. This is a side hill adjustment, tractor and guide can be operated near fence, and there is a guide on each side for listing.

World's largest Diesel tractor fleet. Sugar News. v. 15, no. 9. September, 1934. p. 514. Used in transforming 50,000 acres of mesquite and brush covered desert into irrigable farming land on Pima Indian Reservation at Sacaton, Arizona. 22 Caterpillar 50 H.P. Diesel and twelve 60 H.P. gasoline tractors are engaged in task of clearing, leveling, bordering and ditching land which government is preparing for Pima Indians.

### Ventilation.

Give your hens fresh air. By F. L. Fairbanks. American Agriculturist. v. 13, no. 22. October 27, 1934. p. 3. Two types of ventilating systems for poultry houses or, more correctly, two arrangements of apparatus commonly used in ventilation of poultry houses: 1. Rafter outtake and set-out-curtain intake system. 2. Chimney or warm insulated outtake flue and window intake system.

Ventilation of poultry houses. By F. L. Fairbanks and A. M. Goodman. 1935. 22p. New York state college of agriculture. Cornell extension bulletin no. 315.

### Water Requirements of Plants.

Study on effects upon sugar cane plants of different ages of temporarily withholding supply of water from culture. By Rafael B. Espino and



Water Requirements of Plants. (Cont'd)

Valeriano A. Borja. Sugar News. v. 15, no. 12. December, 1934. p. 715-722. Object of study were: (a) to determine effects upon sugar cane plants of different ages of temporarily withholding supply of water from cultures; and (b) to determine how far sugar cane plants so treated can recover, if they are again supplied with water.

Water Supply.

Dams or ponds to conserve water. By L. F. Livingstone. Agricultural Engineering. v. 16, no. 3. March, 1935. p. 115.

Utah Supreme Court decisions confuse underground water law. By C. J. Ullrich. Engineering News-Record. v. 114, no. 14. April 4, 1935. p. 487-488. Two recent rulings on cases involving artesian wells leave water users in doubt as to application of correlative rights, doctrine of prior appropriation or "property of the soil."

Water System.

It's not the cost. By J. Brownlee Davidson. Successful Farming. v. 33, no. 4. April, 1935. p. 13, 34-35. Figures are low, but getting started halts most people who want running water in their homes.

Wheels.

Strength testing procedure for agricultural implement type of spoked wheel. By O. B. Zimmerman. Agricultural Engineering. v. 16, no. 3. March, 1935. p. 103-109.

Windmills.

Serviceable windmill built from junk parts. Popular Mechanics. v. 63, no. 1. January, 1935. p. 145. This windmill cost owner nothing as he had junk parts from which it was built. Two oil drums are cut in half vertically to provide vanes, which were mounted on wooden frame to rotate on horizontal plane. Frame was centered and securely fastened to an auto wheel by means of U-bolts, and wheel was then keyed to end of driveshaft on rear-axle assembly, which was rigidly fastened on tower made of poles and old lumber. With this arrangement it was necessary to make both axles of rear end work as one, and therefore spaces between spider gears was filled with lead to lock them. On end of one axle, wood pulley was keyed, this being provided with eccentric pin to drive wooden pitman, lower end of which was connected to pump.

Winds light our homes. By J. Leo Ahart. Capper's Farmer. v. 46, no. 4. April, 1935. p. 18. Generating mill was designed and built, consisting of constant voltage, varying speed, 40-volt generator of one kilowatt capacity, driven by roller chain from large three bladed propeller, 14 feet in diameter. Machine was mounted on 40-foot tower on a hill 300 feet above house, and current is carried over circuit of No. 4 wire to large 375 ampere-hour storage battery located in



Windmills. (Cont'd)

house basement. Instrument board is also in basement. It is equipped with automatic cut-out switch, meter, ammeter, necessary flues, and provision for charging auto and radio batteries from large battery. Wiring is so arranged that current flows directly from mill to any appliance being used without going through battery whenever mill is running. Excess current goes into battery, and if enough is not being made to meet load, battery automatically supplies extra current needed.

Wood Preservation.

Creosoting fence posts. Dakota Farmer. v. 55, no. 3. February 2, 1935. p. 36. Most thorough and practical method of treating fence posts on farm with coal-tar creosote, is so-called hot and cold bath open tank process. In this treatment, two tanks are usually used. Tanks can be made by cutting head out of each of two 110-gallon metal oil drums. Drums should be strong enough to hold weight of posts and oil, and be so arranged that they can be heated either by fire beneath them, or by steam from steam boiler. Posts are placed butt end down in one of tanks and creosote is then poured in to about a foot from the top. It is heated to a temperature of 200 to 220 degrees F. for one to three hours. Following heat treatment, posts are quickly transferred to other tank which contains creosote heated to about 100 degrees (cold bath), and left there one or more hours. Treatment may be made in just one tank by first heating posts and oil to specified temperature for one to three hours, and then allowing posts and oil to cool together.

Resistance of creosoted piles to borer attack in tidewater. Engineering News-Record. v. 114, no. 11. March 14, 1935. p. 383. Timber with wide sapwood ring, proper air seasoning, maximum impregnation with oil, and careful handling, insures long service.

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